

IN THE CLAIMS:

1. (Previously presented) A method of fabricating an article protected by a thermal barrier coating system, comprising the steps of  
providing an article substrate having a substrate surface; thereafter  
producing a pre-oxidized bond coat on the substrate surface, the step of producing the pre-oxidized bond coat including the steps of  
depositing a diffusion aluminide bond coat on the substrate surface, the bond coat having a bond coat surface, and  
controllably oxidizing the bond coat surface to form a pre-oxidized bond coat surface; and thereafter  
depositing a thermal barrier coating overlying the pre-oxidized bond coat surface, the thermal barrier coating comprising yttria-stabilized zirconia having a yttria content of from about 3 percent by weight to about 5 percent by weight of the yttria-stabilized zirconia.
2. (Original) The method of claim 1, wherein the step of providing the article substrate includes the step of  
providing the article substrate comprising a nickel-base superalloy.
3. (Original) The method of claim 1, wherein the step of providing the article substrate includes the step of  
providing the article substrate comprising a component of a gas turbine engine.
4. (Cancel)
5. (Original) The method of claim 1, wherein the step of depositing the bond coat includes the step of  
depositing a platinum aluminide bond coat.

6. (Original) The method of claim 1, wherein the step of controllably oxidizing the bond coat includes the step of

heating the bond coat in an atmosphere having a partial pressure of oxygen of from about  $10^{-5}$  mbar to about  $10^3$  mbar.

7. (Original) The method of claim 1, wherein the step of controllably oxidizing the bond coat includes the step of

heating the bond coat in an atmosphere having a partial pressure of oxygen of from about  $10^{-5}$  mbar to about  $10^{-2}$  mbar.

8. (Original) The method of claim 1, wherein the step of controllably oxidizing the bond coat includes the step of

heating the bond coat in an atmosphere having a partial pressure of oxygen of about  $10^{-4}$  mbar.

9. (Original) The method of claim 1, wherein the step of controllably oxidizing the bond coat includes the step of

heating the bond coat to an oxidizing temperature of from about 1800°F to about 2100°F.

10. (Original) The method of claim 1, wherein the step of controllably oxidizing the bond coat includes the step of

heating the bond coat to an oxidizing temperature for a time of from about 1/2 hour to about 3 hours.

11. (Original) The method of claim 1, wherein the step of controllably oxidizing the bond coat includes the step of

heating the bond coat to a temperature of from about 2000°F to about 2100°F, for a time of from about 1/2 hour to about 3 hours, and in an atmosphere having a partial pressure of oxygen of about  $10^{-4}$  mbar.

12. (Original) The method of claim 1, wherein the steps of depositing the bond coat and controllably oxidizing the bond coat are performed concurrently.

13. (Original) The method of claim 1, wherein the step of controllably oxidizing the bond coat is performed after the step of depositing the bond coat.

14. (Original) The method of claim 1, wherein the step of depositing the thermal barrier coating includes the step of depositing the thermal barrier coating by physical vapor deposition.

15. (Original) The method of claim 1, wherein the step of depositing the thermal barrier coating includes the step of depositing the thermal barrier coating to have the yttria content from about 3.8 to about 4.2 percent by weight of the yttria-stabilized zirconia.

16. (Original) A method of fabricating an article protected by a thermal barrier coating system, comprising the steps of providing an nickel-base superalloy article substrate comprising a component of a gas turbine engine and having a substrate surface; thereafter depositing a platinum aluminide bond coat on the substrate surface, the bond coat having a bond coat surface; thereafter controllably oxidizing the bond coat surface to form a pre-oxidized bond coat surface; and thereafter depositing a thermal barrier coating overlying the pre-oxidized bond coat surface, the thermal barrier coating comprising yttria-stabilized zirconia having a yttria content of from about 3 percent by weight to about 5 percent by weight of the yttria-stabilized zirconia.

17. (Original) The method of claim 16, wherein the step of controllably oxidizing the bond coat includes the step of

heating the bond coat in an atmosphere having a partial pressure of oxygen of from about  $10^{-5}$  mbar to about  $10^3$  mbar.

18. (Original) The method of claim 16, wherein the step of controllably oxidizing the bond coat includes the step of

heating the bond coat to an oxidizing temperature of from about 1800°F to about 2100°F.

19. (Original) The method of claim 16, wherein the step of depositing the thermal barrier coating includes the step of

depositing the thermal barrier coating to have the yttria content from about 3.8 to about 4.2 percent by weight of the yttria-stabilized zirconia.

20. (Previously presented) The method of claim 1, wherein the step of producing includes the step of

producing a pre-oxidized bond coat surface having a layer of  $\text{Al}_2\text{O}_3$  thereon.

21. (Currently amended) The method of claim 16, wherein the step of ~~producing~~ controllably oxidizing includes the step of

~~producing a pre-oxidized~~ controllably oxidizing the bond coat surface ~~having to produce~~ a layer of  $\text{Al}_2\text{O}_3$  thereon.

22. (Previously presented) A method of fabricating an article protected by a thermal barrier coating system, comprising the steps of

providing an article substrate having a substrate surface; thereafter

producing a pre-oxidized bond coat on the substrate surface, the step of producing the pre-oxidized bond coat including the steps of

depositing a bond coat on the substrate surface, the bond coat having a bond coat surface, and

controllably oxidizing the bond coat surface to form a pre-oxidized bond

Attorney Docket No.: 13DV-13716 (21635-0034)

Application No.: 09/943,782

- 6 -

coat surface; and thereafter

depositing a thermal barrier coating overlying the pre-oxidized bond coat surface, the thermal barrier coating comprising yttria-stabilized zirconia having a yttria content of from about 3 percent by weight to about 5 percent by weight of the yttria-stabilized zirconia.

23. (Currently amended) The method of claim ~~23~~ 22, wherein the step of producing includes the step of

producing a pre-oxidized bond coat surface having a layer of  $\text{Al}_2\text{O}_3$  thereon.